

A new *Culicoides* Biting Midge from California

(Diptera: Ceratopogonidae)

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Through the courtesy of Paul H. Arnaud, Jr. of the California Academy of Sciences I received for study a fine collection of biting midges taken by Hugh B. Leech at Howell Mountain, Napa County, California. Most of this collection consisted of a remarkable new species of *Culicoides* of the *palmerae* group that was not found when Wirth and Rowley (1971) revised the group. The new species is closely related to *Culicoides utahensis* Fox, the interesting habits and anatomical modifications of which were discussed in our revision. In *C. utahensis* the male antennae and palpi are not of the normal male type, but closely resemble those of the female, presumably to enable the male to locate the same warm-blooded animal as the female, and there to mate on contact with her. Both sexes of *utahensis* have been found *in copulo* deep inside the base of the ears of jackrabbits, sheep, and deer in California. In the present collection, which was taken at light, a considerable number of individuals of the new species were found *in copulo*; and the males are characterized by the same female-type modifications of the antennae and palpi found in *C. utahensis*. The new species is easily recognized as it is much larger and darker than *utahensis*; and the males differ markedly in some features of their genitalia. I am very pleased to name this species after the collector, Mr. Hugh B. Leech of the California Academy of Sciences, in appreciation of his friendship and his long and continued interest in collecting biting midges throughout western North America.

The reader is referred to the revision of Wirth and Rowley (1971) for a diagnosis and discussion of the *palmerae* group, for explanation of the terminology used, and for a key to species and a table of numerical characters for the separation of closely related species.

Culicoides leechi, new species

(Fig. 1)

Female Allotype. — Wing length 1.61 mm, breadth 0.76 mm.

Head: Eyes (fig. 1d) broadly separated. Antenna (Fig. 1a) with lengths of flagellar segments in proportion of 32-21-22-22-23-23-23-38-41-42-44-57; AR 1.18; sensory pattern 3-15. Palpal segments (Fig. 1f) with lengths in proportion of 15-35-60-22-20; third segment greatly swollen, with large, round, moderately deep, sensory pit; PR 2.2. Proboscis long, P/H ratio 0.90; mandible with 15 teeth.

Thorax: Dark brown without prominent pattern. Legs with femora and tibiae dark brown, tarsi paler; tibial comb with 4 spines, the second from the spur longest. Wing with pattern as figured (Fig. 1c); pattern restricted to two small anterior pale spots, one over the crossvein and second on anterior wing margin just distad of tip of costa; a dark stigma present formed by the darkened heavier veins forming second radial cell and distal half of first; CR 0.59; macrotrichia numerous over entire wing, rather long and spinelike. Halter moderately infuscated.

Abdomen: Brown. Spermathecae (Fig. 1h) two plus an elongate rudimentary third, sclerotized ring absent; functional spermathecae subequal in size, each measuring 0.067 by 0.045 mm, ovoid with slightly oblique, short, tapering necks.

Male Holotype. — Wing length 1.47 mm, breadth 0.69 mm. Eyes (Fig. 1e) narrowly separated; mandibular teeth vestigial. Antenna (Fig. 1b) similar to that of female, lengths of flagellar segments in proportion of 35-21-21-22-22-23-24-25-36-36-40-42-60; PR 1.7. Wing pattern as in female; CR 0.59. Genitalia (Fig. 1j): Ninth sternum with very shallow caudo-median excavation, the ventral membrane not spiculate; ninth tergum elongate and tapering distad, with prominent elongate apicolateral processes much stouter and more flaring than in *C. utahensis*, the caudal margin between them slightly convex with slight mesal notch. Basistyle moderately stout, ventral and dorsal roots simple, the ventral root short and the dorsal elongate and slender; dististyle evenly curved, not hooked at base, tapering to moderately slender, blunt tip. Aedeagus short and stout with broad base,

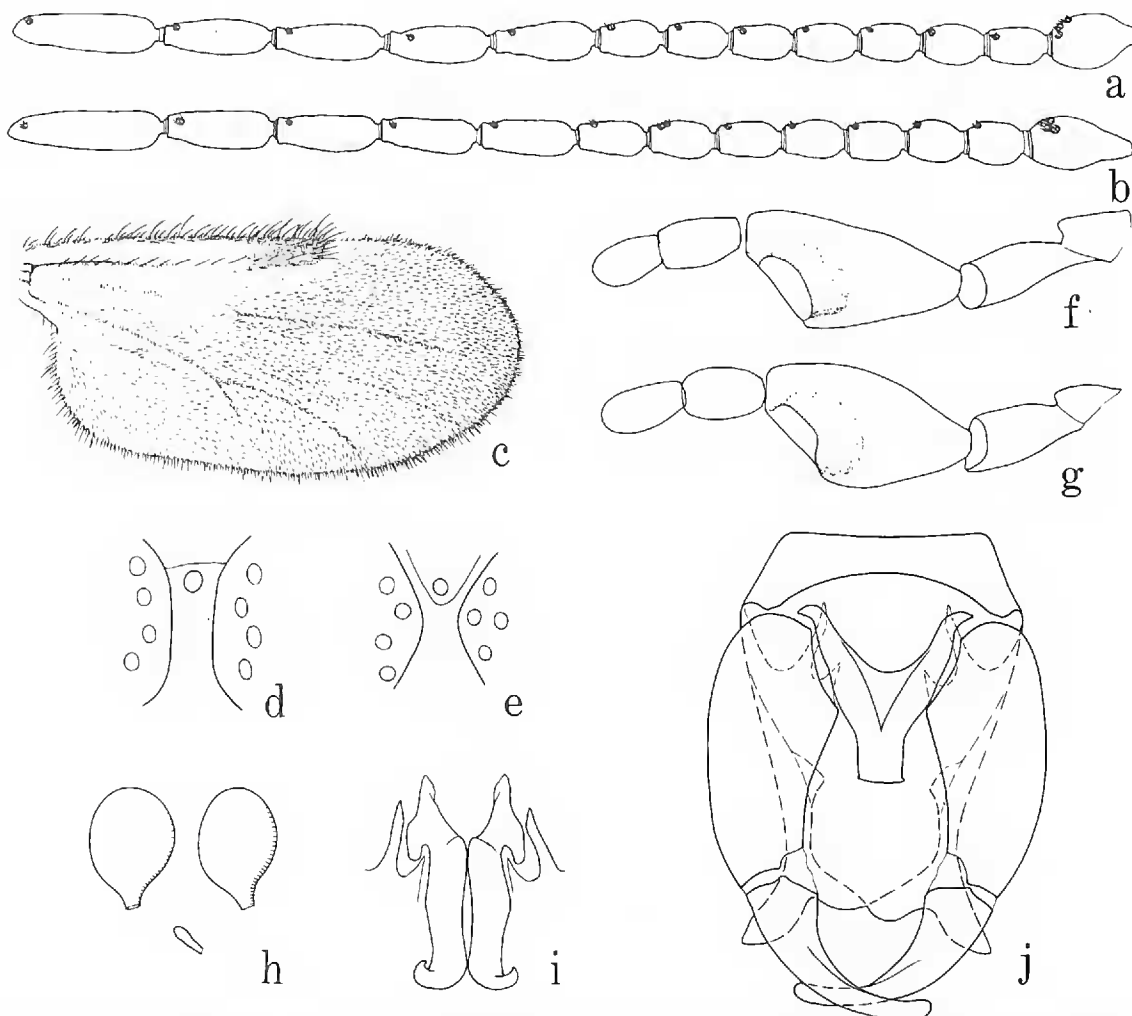


Fig. 1. *Culicoides leechi* n. sp. a,c,d,f,h, female; b,e,g,i,j, male; a,b, antenna; c, wing; d,e, eye separation; f,g, palpus; h, spermathecae; i, parameres; j, genitalia, parameres removed.

basal arch extending to 0.4 of total length, apex broad and truncate, not quite as broad and flaring as in *C. utahensis*. Parameres (Fig. 1i) each with prominent basal process delimited by a sub-basal constriction, stem stout and slightly tapering distally, abruptly bent ventrolaterad distally with a simple pointed tip that is stouter than in *C. utahensis*.

Distribution. — California.

Types. — Holotype male, allotype female, Napa County, California, north side of Howell Mountain 2 miles NNE of Angwin, 1300 feet, 17 May 1975, H. B. Leech, at light (Type no. 12640, Calif. Acad. Sci.). Paratypes, 39 males, 22 females, and 8 pairs *in copulo*, same data (in Calif. Acad. Sci. and USNM); 1 male, Pozo, San Luis Obispo Co., California, 27 April 1962, P. D. Hurd, light trap (USNM).

Taken in the same collection with *Culicoides leechi* n. sp. were the following *Culicoides* species: *C. utahensis* Fox, 5 males, 1 female; *C. oregonensis* Wirth and Rowley, 4 males, 3 females (also in the *C. palmerae* group); *C. neomontanus* Wirth, 12 females; *C. neofagineus* Wirth and Blanton, 1 female; and *C. lahontan* Wirth and Blanton, 1 female. Dr. Arnaud also sent me 1 female of *C. neofagineus* taken by Mr. Leech at Howell Mountain 9 June 1975, with note "bit my arm, late evening after dark; bite did not itch for long."

Literature Cited

- Wirth, W. W., and W. A. Rowley 1971. A revision of the *palmerae* group of the genus *Culicoides*. Kansas Entomol. Soc. 44:153-171.

RECENT LITERATURE

Geographic Variability in *Speyeria*: Comments, Records and Description of a New Subspecies (Nymphalidae). A. H. Moeck. 48 pp. 1957. (Reprinted by Entomological Reprint Specialists, P.O. Box 77224, Dockweiler Station, Los Angeles, California 90007). \$3.50.

As one who had the treasured experience of sitting in the old country house enjoying the warm hospitality of L. Paul Grey, Lincoln, Maine and listening to his ruminations about *Speyeria* variability, I was delighted to read a study the stimulus for which was in large part provided by Mr. Grey in the same setting. Mr. Moeck described one subspecies, *zerene gloriosa*, and discussed *idalia*, *edwardsii*, *cybele*, *aphrodite*, *coronis*, *zerene*, *callippe*, *egelis*, *atlantis*, and *hydaspe*. This reprinted work is still a very useful guide to a tough complex of North American fritillary butterflies. — TDE.

Population Genetics and Ecology (Proceedings of the Conference held in Israel, March 1975). Edited by S. Karlin and E. Nevo. Academic Press, New York, San Francisco, London. 1976. 846 pp. \$25.50.

The Insects of Virginia: No. 9. Squash, Broad-headed, and Scantless Plant Bugs of Virginia (Hemiptera: Coreoidea: Coreidae, Alydidae, Rhopalidae). R. L. Hoffman. Virginia Polytechnic Institute and State University Research Division Bulletin 105: 1-52. 1975. Available on exchange basis from the Distribution Center, VPI&SU, Research Division Publications, 111 Landsdowne Street, Blacksburg, Virginia 24060.

This publication covers 27 species of coreoid bugs known from Virginia and treats them from the standpoint of geographic distribution, seasonal occurrence, and host plant preferences. Keys are provided for all included taxa. — TDE.